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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Elvir Causevic

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EXAMINER

NATNITHITHADHA, NAVIN

ART UNIT

PAPER NUMBER

3735

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/587,806	Applicant(s) CAUSEVIC ET AL.	
	Examiner NAVIN NATNITHITHADHA	Art Unit 3735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-8,12,13 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 is/are allowed.
- 6) ☒ Claim(s) 1-4,6-8,13 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 November 2008 has been entered.

Response to Amendment

2. According to the Amendment, filed 19 November 2008, the status of the claims is as follows:

Claims 1-4, 6-8, 13, 17, and 18 are currently amended;

Claims 12, 19, and 20 are previously presented; and

Claims 5, 9-11, and 14-16 are cancelled.

Response to Arguments

3. Applicant's arguments, see Remarks, pp. 7-8, filed 19 November 2008, with respect to the rejection of claims 1-4, 6-8, and 13-20 under 35 U.S.C. 103(a) as being unpatentable over Penn et al, U.S. Patent No. 6,731,976 B2 ("Penn"), in view of Zierhofer, U.S. Patent No. 6,600,955 B1 ("Zierhofer"), and further in view of Najafi et al,

U.S. Patent No. 7,211,048 B1 ("Najafi"), have been fully considered, but they are not persuasive.

Applicant contends, see Remarks, pp. 7-8, the following:

None of the prior art asserted by the Examiner in the Final Rejection, *viz.*, Penn, Zierhofer and Najafi, disclose or suggest this limitation of claims 1 and 13. More specifically, none of the cited prior art describe that only the front-end of a sigma delta (E-A) analog-to-digital converter (i.e. the F-A modulator) is placed in the implantable device, and that the generated 1-bit data sequence is wirelessly transmitted to an external processing unit where the data is filtered for complete implementation of the sigma-delta analog-to-digital conversion process.

However, this argument is not persuasive. Zierhofer teaches an implantable bioelectric signal processing system, comprising: an implanted sigma-delta modulator 113 that converts an analog signal into a high-frequency 1-bit sequence (see col. 17, ll. 11-27), wherein after measurement these data are sent to outside by means of load modulation (see col. 6, ll. 49-55). Najafi provides the suggestion to combine Penn system with Zierhofer's implanted sigma-delta modulator. See the 35 U.S.C. 103(a) rejection below.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-4, 6-8, 13, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Penn et al, U.S. Patent No. 6,731,976 B2 ("Penn"), in view of Zierhofer, U.S. Patent No. 6,600,955 B1 ("Zierhofer"), and further in view of Najafi et al, U.S. Patent No. 7,211,048 B1 ("Najafi").

Claim 1: Penn teaches the following:

an implantable brain state monitoring system (see Abstract, and figs. 2, 11-13, and 15) comprising:

an interface ("implanted probe") 12 configured to receive an analog brain electrical signal from at least one electrode ("sensor") 16 implanted on a subject (see col. 5, ll. 3-10);

a analog-to-digital converter ("probe electronics") 18/58 to convert the said analog brain electrical signal (see col. 7, ll. 48-54);

a transceiver ("transmitter") 60 coupled to said analog-to-digital converter 58, said transceiver 60 configured to communicate said data stream to a remote processing system ("external device") 14 over a wireless communications link (see fig. 15, col. 2, ll. 16-23, and col. 7, l. 48, to col. 8, l. 24);

wherein said data is representative of the received analog brain electrical signal, which is further filtered and processed in an external processor ("external electronics") 24 to extract information about the received signal;

an antenna ("probe coil") 20 coupled to a capacitor circuit ("power capacitor") 76, for receiving and storing power which is transmitted wirelessly from an external source 14, said capacitor circuit 76 and antenna 20 configured to indirectly stimulate the process of signal reception from said at least one electrode in response to said transmitted power (see col. 9, l. 65, to col. 10, l. 9).

Penn does not teach a "sigma-delta modulator to convert said analog brain electrical signal into a 1-bit data stream", "said transceiver configured to communicate said 1-bit data stream...", and "wherein said 1-bit data is representative of the received analog

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brain electrical signal". However, Zierhofer teaches an implantable bioelectric signal processing system ("electrically evoked action potential", or "EAP", measurement, see col. 5, ll. 23-54), comprising: an implanted sigma-delta modulator 113 that converts an analog signal into a high-frequency 1-bit sequence (see col. 17, ll. 11-27), wherein after measurement these data are sent to outside by means of load modulation (see col. 6, ll. 49-55). In addition, Najafi teaches the following in regards to wireless communication of sensor data between an "implant device 201" and an external "power source/reader 202" (see fig. 3, and col. 4, ll. 37-49):

The signal conditioning circuit 211 processes an output signal from the sensor 206 and prepares it for transmission to an external receiving and/or analyzing device. For example, many pressure sensors output a capacitance signal that may be digitized for radio frequency (RF) transmission. Accordingly, the signal conditioning circuit 211 places the output signal of the sensor into an appropriate form. Many different signal conditioning circuits are known to those skilled in the art. Capacitance to frequency conversion, sigma delta or other analog to digital conversion techniques are all possible conditioning circuits that may be used in a preferred embodiment.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Penn's "probe electronics" 18/58 to include a sigma-delta modulator as taught by Zierhofer because it is "preferred due to the tolerance of noisy supply voltages and manufacturing variations" (see Najafi, col. 3, ll. 46-47).

Claims 2, 6, and 7: Penn teaches wherein said interface 12, said analog-to-digital converter 18/58, and said transceiver 60 are disposed within a common matrix 12, e.g. a single integrate circuit (see fig. 15), configured for implantation within an organism.

Claims 3 and 4: Penn teaches the following (see fig. 15 and col. 9, l. 65, to col. 10, l. 67): wherein said antenna 20 receives power via RF emission from an electrical winding

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disposed in proximity to said antenna 20, said electrical winding configured to receive a controlled flow of electrical current from an external power source 26 to generate an electromagnetic field, wherein flow of electric current to the said electrical winding is controlled by an external signal processing system 14; and wherein the external signal processing system 14 triggers the said implantable system wirelessly, via the controlled flow of electric current to the electrical winding, to start receiving bioelectric signals from said organism through at least one implantable electrode 16 disposed within said organism.

Claim 8: Penn does not teach “wherein said interface includes a signal amplification component for amplifying said received analog bioelectric signal”.

However, Zierhofer teaches an “amplifier” 112 that amplifies the measured “input signal” 106 (see col. 17, ll. 11-27). Thus, it would be have been obvious for one of ordinary skill in the art at the time the invention was made to modify Penn’s “probe electronics” 18/58 to include an amplifier in order to amplify the signal to provide a more accurate representation of the physiological parameter being monitored.

Claims 13 and 17-20: Because the subject matter of claims 13 and 17-20 directed to a method for acquiring bio-electric signals from an organism that is not distinct from the subject matter of claims 1-4 and 6-8 above directed to the implantable bioelectric signal processing system, discussed above, Penn in view of Zierhofer and Najafi teaches claims 13 and 17-20 for the same reasons as that provided for claims 1-4 and 6-8 above.

Allowable Subject Matter

5. Claim 12 was previously allowed in the Office Action, mailed 14 September 2007. The reason for allowable subject matter was provided in that Office Action.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The other patents cited in the PTO-892 teach subject matter related to the Applicant's claims. The Examiner suggests reviewing these patents before responding to the present Office Action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAVIN NATNITHITHADHA whose telephone number is (571)272-4732. The examiner can normally be reached on Monday-Friday, 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor, II can be reached on (571) 272-4730. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Navin Natnithithadha/
Examiner, Art Unit 3735
02/17/2009